

The University of Chicago

**A STUDY OF SPRANGER'S VALUE-
TYPES BY THE METHOD OF
FACTOR ANALYSIS**

**A PART OF A DISSERTATION SUBMITTED
TO THE FACULTY OF THE DIVISION OF
THE BIOLOGICAL SCIENCES IN CANDI-
DACY FOR THE DEGREE OF DOCTOR OF
PHILOSOPHY**

**DEPARTMENT OF PSYCHOLOGY
1935**

**By
WALTER ALBERT LURIE**

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A STUDY OF SPRANGER'S VALUE-TYPES BY THE METHOD OF FACTOR ANALYSIS*¹

University of Chicago

WALTER A. LURIE

THE PROBLEM

This study is an application of the Thurstone multiple factor technique to the problem of personality classification. Professor Thurstone (14) and his students have made one approach to the problem in their analysis of ratings on trait-names, in which they found five major clusters of adjectives describing personality. Whisler (16) has recently attacked the same problem in his analysis of generalized attitudes. Cattell (5), Oates (7), and Pinard (8, 9), of the Spearman group and using Spearman's methods, have made investigations which bear more or less directly on personality classification.

These investigations have been somewhat less fruitful than they might have been, in part because of imperfect factor methods, in part, perhaps, because of the difficulty of interpreting patterns. The present analysis was designed to obviate confusion by applying Thurstone's improved techniques to data previously classified according to a widely accepted rational type system, that of Eduard Spranger. It was thought that interpretation of factors in such material would offer fewer difficulties. According to the view here presented, the process of obtaining plausible and self-consistent categories for the classification of personality is logically similar to a method of approximations, in that one narrows the field of search by starting with a rational classification as the first approximation and constructs a test to differentiate individuals falling into these various types, then

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performs a factor analysis upon the data so obtained. From the analysis he determines what are the primary variables in the system, corresponding directly to the factors. Thereafter he may build a test using the newly found primary categories. In this study, Spranger's types were taken as first approximations, and on them as a base a test was written, was given, was scored, and intercorrelations of the types were computed; upon this material a factor analysis was performed, and a new type-pattern was derived.

THE TEST

Spranger's types, as described in his book (11), are so well known as to require little comment. It is sufficient to recall that the six types of men, or, as Vernon and Allport (15) have pointed out, of values or interests, are: the *theoretical*, cognitive, rational, and scientific; the *economic*, utilitarian, interested in things which are useful; the *aesthetic*, interested in form and harmony; the *social*, primarily interested in people, human relations; the *political*, interested in power; and the *religious*, seeking some ultimate meaning of life or mystical unity with the cosmos. This basic classification, with the more complete description of the types, is all of Spranger's thought that was used in this study; his hierarchy of types does not enter.

The tests were constructed in such a way that there were 24 items corresponding to each of Spranger's types, with a score for each individual in each of the 144 items. A number of questions and statements were written, of such kind that each question could be answered in six ways corresponding to Spranger's types, and each statement be completed in those six ways. With each question six alternative answers were presented, one made to correspond as exactly as possible to the description of each of the types as given by Spranger; similarly, six completing statements were furnished with each assertion. Material similar to that used by Allport and Vernon was selected, because it offers a fairly wide sampling of the subject's opinion. It was observed that all the material could be more or less arbitrarily classified as dealing with: (a), the present *interests* in activities and external objects; (b), the *ideals*, standards, and ambitions; (c), the *preferences with regard to people*, associates, or famous personages; or (d) the *beliefs* and opinions, of the persons taking the test. Items which did not seem to be cleancut as to type were rejected. A final selection was made of 36 items in each of the four

classes, six for each of Spranger's types. A score was obtained for each item by having the subject rate his acceptance of it on a seven-point scale, from zero for "Complete Rejection" through one for "Strong Disapproval," two for "Mild Disapproval," three for "Complete Indifference," four for "Mild Approval," and five for "Strong Approval," to six for "Complete Acceptance." A keyed sample test-blank is appended with abbreviations used in scoring in Table 4 which precedes it.

Items were selected first of all for correspondence to Spranger's descriptions. The second criterion was estimated diagnostic value with regard to type; this was not of primary importance, as no attempt was made to throw individuals into the different categories, and it was necessary only to weed out items likely to be answered in the same way by almost all of the subjects. Items were equated for attractiveness, in so far as possible, by choosing only such as would presumably be completely acceptable to people of the corresponding type. The procedure was sufficiently painstaking, because the rating technique used in obtaining scores minimized the importance of variations in attractiveness of items, as contrasted with the direct comparison used by Allport and Vernon, which maximizes it. Six answers to each question were always matched for generality or specificity, form of statement, and field of experience involved, in so far as was possible.

PROCEDURE

Six hundred papers were distributed among students in the Biological Sciences Survey Course at the University of Chicago. They were given on a volunteer basis. No directions were added to those printed on the blanks, except that the admonition to answer all the items was repeated orally. Two hundred and sixty-five subjects returned blanks which they had filled out. The selective factors at work in determining which students answered and which discarded the tests were of no importance in this study, as it is only the interrelations of the scores on the various items with which the investigation was concerned. Of the subjects who returned papers, 110 failed to answer all the items. Sixty-two papers were discarded because of many omissions. Forty-eight incomplete papers, of which 35 had one of 144 items omitted and 13 of which had two items omitted, were retained, the blank spaces being arbitrarily scored as

three, as if they had been marked in the "Completely Indifferent" column, psychologically the most probable score. These papers, the writers of which had probably reserved the unmarked items for decision after completing the whole test, differed markedly from the discarded blanks, in which whole questions or pages were omitted. Of the 203 subjects retained, all were white, almost all were freshmen or sophomores, almost all were 18 or 19 years old. One hundred twenty-eight were men, 75 were women. There were 79 Protestants, 55 Jews, 49 professing no religion, 18 Catholics, and two members of the Greek Orthodox Church. The parents of the subjects were professional or capitalist and white-collar workers in about equal proportions, with a scattering of artisans and laborers. Comparatively few of the students had reached decisions as to their department of specialization in future college work or as to the choice of a vocation.

Taking one rating-step as the unit, a score of zero was assigned to every item marked by the subject in the "Complete Rejection" column, one for "Strong Disapproval," and so on, consecutively, to six for "Complete Acceptance." Twenty-four scores were computed for each individual, a theoretical interests score being computed by adding the acceptance ratings on the six items of the theoretical type in the class of interests, a theoretical ideals score by adding scores for the six theoretical ideals items, and similarly for the six types of items in the four classes. Simple scores in the six types were not used because of the desirability of having a larger number of variables in the correlation matrix to define unambiguously the factors involved. The adding of these ratings involves the assumption that, for instance, "Mild Approval" of any item indicates a degree of acceptance of the item greater than "Complete Indifference" to the same extent that this is greater than "Mild Disapproval," and so on, for the other ratings. Nothing in the papers would lead one to believe that the step-intervals were not regarded by the subjects as consecutive and approximately equal; there is probably very little error introduced by treating the scores in this manner.

Tetrachoric correlation coefficients were computed for all pairs of scores by means of computing diagrams (6). The use of tetrachoric coefficients involves the assumption of a normal correlation surface. As a matter of fact, the distributions of raw scores in the 24 variables are more or less bell-shaped and fairly symmetrical. The tetra-

choric coefficients are rather stable, and they give close approximations to the relationships of the obtained scores. However, we are not impelled by the logic of the problem to measure our variables in the arbitrary units corresponding to the steps on the acceptance scale. The only condition imposed upon our choice of a unit is that the derived scores must be some monotonic function of the obtained scores. We know, for instance, that an obtained aesthetic beliefs score of 20 represents a greater amount of the variable than one of 19, but not how much greater. The raw scores in each variable form a series of intensive magnitudes. It is, therefore, a perfectly justifiable procedure to measure the variables in scores which are normally distributed, subject only to the one condition stated. If it were necessary to do so, we could distort the arbitrary units for each variable in such a way as to form a scale on which the scores exhibit a Gaussian distribution in this population, and we might then compute Pearson product-moment correlations of these derived scores. It is entirely unnecessary to go through that process, because the tetrachoric coefficients computed from the obtained distributions are identical with the product-moment correlations of the derived scores, within the limit of errors of measurement.

For computation of the tetrachoric coefficients it was necessary to obtain the proportion of subjects scoring above a certain point in one of the related measures and above a chosen point in the other, above in the first and below in the second, below in the first and above in the second, and below in both. These proportions were ascertained by sorting scores on cards. The distributions were cut near the medians to avoid the increased margin of error near the tails; the highest proportion "above" in any item was .66, the lowest .46. Each coefficient was read from two different diagrams by combining the proportions differently. Every stage of the scoring and correlating process was checked. Correlations were read to two decimal places, which is as precise a reading as the data warrant.

The intercorrelations were then analyzed by the centroid method (13), following the procedure outlined in the pamphlet except in the use of pivot tests. In place of this method, the number of positive signs in the correlation table was maximized by changing the sign of tests with negative correlations in the majority until further change brought no gain. A similar process was followed for each set of residuals. After seven factors had been extracted, the residuals

had a mean absolute value of .042 with a standard deviation of .03, and an eighth factor, when the loadings were found, contributed no more than .07 to any of the correlations; therefore, only seven factors were used in subsequent computations. The factorial matrix obtained in this way was then subjected to a transformation in order the better to describe the factors. A simple structure was found to exist, that is, no variable involved all seven factors. The primary categories so isolated were interpreted.

RESULTS

Scores. All scores had standard deviations in the neighborhood of six or seven for the whole group. The means ranged from 17.01 for religious ideals to 30.37 for theoretical beliefs. A score of 36 would indicate complete acceptance of the items in question; 18, complete indifference; and zero, complete rejection. While the equivalence of scores in the different traits has not been carefully investigated, it is obvious from the magnitude of the differences that this is a comparatively low "religious" and comparatively high "theoretical" group.

Cantril and Allport (3) and Pintner (10) have reported that women score higher in aesthetic, social, and religious values on the Allport-Vernon blank, and that men score higher in theoretical, economic, and political values. Although the differences are of doubtful significance, the general trend of scores on this blank is closely similar to the one which they found, suggesting that very much the same thing is being measured. A reversal occurs in the case of economic beliefs, in which women score slightly higher, and in all theoretical scores except interests. The general level of women's scores is slightly higher than that of the men's scores and is, presumably, effective in producing reversals.

Correlations. The highest correlation is .76, between religious ideals and religious preferences in people. The only negative correlation occurring between two traits supposedly representing the same type is that of $-.02$ between political interests and political preferences in people; this may indicate a failure to select items corresponding nearly enough to the type, but possibly points toward a weakness in the classification. All other intratype correlations are positive, and most of them rather high. The economic items corre-

late with political items about as well as the scores of each type do among themselves. The religious items have a close relationship with the social and with the aesthetic items, and the social and aesthetic with each other. Aesthetic items are negatively correlated with economic and political items.

The Factor Analysis. The factor loadings are given in Table 1. Also shown is h^2 , the communality, indicating the proportion of the total variance in each score accounted for by the seven factors, the rest being due to specific factors and chance errors. The amount of the total variance, 24, due to each factor is shown at the bottom. The factors are described in terms of arbitrary orthogonal axes, merely as a matter of convenience.

If we were to stop here and regard the solution as complete (and this is done in many factor studies), the criticism that Allport (1) makes of Perry's study, that the independent factors discovered by analysis lack meaning, would be to a large extent justified. Fortunately, there is no need to depend on these arbitrary axes in describing the interrelations of the variables. We look next for a simple structure. It is possible to perform a transformation to a system of oblique coordinates conforming directly to the constellations of the points representing the variables, according to any criterion of conformity which we may wish to set up.

However we may alter the appearance of the factorial matrix by transformation, it represents the same configuration of the variables. When there are many high loadings in a column, as there are when the loadings are expressed with reference to the centroid axes, it is difficult to grasp the underlying relationships; but, if only a few are high and the rest insignificant, there is little difficulty in naming the factors. The transformation, then, should make as many loadings as possible zero or almost zero, with only those which are essential remaining significant, so that each trait is described in terms of as few factors as possible. This reduces greatly the chance of being misled in interpretation. It is not possible to make meaningless material appear meaningful by transformation; if the variables are not related in the requisite way, no simple structure can be made to appear.

The loadings may be considered as representing projections of the points corresponding to the variables, the projections being made

TABLE 1
FACTOR LOADINGS (CENTROID AXES)

Variable (1)	Symbol (2)	Items* (3)
1. Theoretical interests	T in	(1 <i>b</i> , 2 <i>f</i> , 5 <i>a</i> , 7 <i>b</i> , 9 <i>d</i> , 16 <i>a</i>)
2. Theoretical ideals	T id	(4 <i>f</i> , 4 <i>i</i> , 8 <i>f</i> , 13 <i>e</i> , 13 <i>j</i> , 13 <i>k</i>)
3. Theoretical preferences in people	T p	(6 <i>i</i> , 6 <i>j</i> , 6 <i>o</i> , 6 <i>v</i> , 11 <i>e</i> , 14 <i>e</i>)
4. Theoretical beliefs	T b	(3 <i>e</i> , 10 <i>a</i> , 12 <i>d</i> , 15 <i>e</i> , 17 <i>e</i> , 18 <i>c</i>)
5. Economic interests	E in	(1 <i>e</i> , 2 <i>d</i> , 5 <i>c</i> , 7 <i>a</i> , 9 <i>c</i> , 16 <i>b</i>)
6. Economic ideals	E id	(4 <i>g</i> , 4 <i>j</i> , 8 <i>c</i> , 13 <i>a</i> , 13 <i>i</i> , 13 <i>m</i>)
7. Economic preferences in people	E p	(6 <i>a</i> , 6 <i>c</i> , 6 <i>g</i> , 6 <i>w</i> , 11 <i>a</i> , 14 <i>c</i>)
8. Economic beliefs	E b	(3 <i>c</i> , 10 <i>f</i> , 12 <i>e</i> , 15 <i>a</i> , 17 <i>c</i> , 18 <i>a</i>)
9. Aesthetic interests	A in	(1 <i>a</i> , 2 <i>c</i> , 5 <i>d</i> , 7 <i>c</i> , 9 <i>b</i> , 16 <i>c</i>)
10. Aesthetic ideals	A id	(4 <i>b</i> , 4 <i>e</i> , 8 <i>b</i> , 13 <i>d</i> , 13 <i>n</i> , 13 <i>r</i>)
11. Aesthetic preferences in people	A p	(6 <i>e</i> , 6 <i>k</i> , 6 <i>r</i> , 6 <i>u</i> , 11 <i>c</i> , 14 <i>b</i>)
12. Aesthetic beliefs	A b	(3 <i>d</i> , 10 <i>b</i> , 12 <i>b</i> , 15 <i>d</i> , 17 <i>a</i> , 18 <i>d</i>)
13. Social interests	S in	(1 <i>d</i> , 2 <i>b</i> , 5 <i>b</i> , 7 <i>e</i> , 9 <i>e</i> , 16 <i>e</i>)
14. Social ideals	S id	(4 <i>c</i> , 4 <i>l</i> , 8 <i>e</i> , 13 <i>h</i> , 13 <i>p</i> , 13 <i>q</i>)
15. Social preferences in people	S p	(6 <i>b</i> , 6 <i>g</i> , 6 <i>l</i> , 6 <i>x</i> , 11 <i>f</i> , 14 <i>f</i>)
16. Social beliefs	S b	(3 <i>a</i> , 10 <i>d</i> , 12 <i>f</i> , 15 <i>b</i> , 17 <i>b</i> , 18 <i>f</i>)
17. Political interests	P in	(1 <i>f</i> , 2 <i>e</i> , 5 <i>f</i> , 7 <i>d</i> , 9 <i>f</i> , 16 <i>d</i>)
18. Political ideals	P id	(4 <i>d</i> , 4 <i>k</i> , 8 <i>a</i> , 13 <i>b</i> , 13 <i>c</i> , 13 <i>f</i>)
19. Political preferences in people	P p	(6 <i>d</i> , 6 <i>f</i> , 6 <i>n</i> , 6 <i>t</i> , 11 <i>b</i> , 14 <i>d</i>)
20. Political beliefs	P b	(3 <i>b</i> , 10 <i>e</i> , 12 <i>c</i> , 15 <i>f</i> , 17 <i>d</i> , 18 <i>b</i>)
21. Religious interests	R in	(1 <i>c</i> , 2 <i>a</i> , 5 <i>e</i> , 7 <i>f</i> , 9 <i>a</i> , 16 <i>f</i>)
22. Religious ideals	R id	(4 <i>a</i> , 4 <i>h</i> , 8 <i>d</i> , 13 <i>g</i> , 13 <i>l</i> , 13 <i>o</i>)
23. Religious preferences in people	R p	(6 <i>h</i> , 6 <i>m</i> , 6 <i>p</i> , 6 <i>s</i> , 11 <i>d</i> , 14 <i>a</i>)
24. Religious beliefs	R b	(3 <i>f</i> , 10 <i>c</i> , 12 <i>a</i> , 15 <i>c</i> , 17 <i>f</i> , 18 <i>e</i>)
Σa^2		

*Items are in test copy at end.

on the normals to planes (or hyperplanes, since in this study we are dealing with seven dimensions) which we may locate where we choose. We wish to place them so that the projections upon the normals or the proportional projections upon the primary axes oblique to the normals will be insignificant in as many instances as possible. The reduction in the number of high loadings is achieved

TABLE 1 (*Continued*)

I (4)	II (5)	III (6)	IV (7)	V (8)	VI (9)	VII (10)	h^2 (11)
.225	— .310	.522	— .429	— .374	— .073	— .147	.77
.428	— .436	.501	— .389	.143	.034	.149	.82
.408	— .558	.524	— .087	.199	.059	.118	.82
.545	— .395	.250	— .066	— .293	— .064	— .067	.62
.217	.713	.168	.051	.126	— .006	— .029	.60
.421	.571	.381	— .180	— .058	— .126	— .082	.71
.374	.495	— .050	— .093	.066	.241	— .166	.49
.371	.359	.160	.319	— .124	.381	— .188	.59
.493	— .441	— .328	.190	.156	— .151	— .388	.78
.437	— .373	— .287	.175	— .026	.171	.431	.66
.480	— .570	— .242	.138	.235	.154	— .241	.71
.484	— .490	— .240	.053	— .160	— .146	.094	.59
.562	.264	— .245	.300	— .363	— .090	.116	.69
.623	.012	— .122	.082	— .359	.272	.198	.65
.768	— .196	— .130	.233	.280	.084	.140	.81
.665	— .129	— .186	.087	— .113	.227	.190	.61
.471	.371	.259	.512	.169	— .031	.236	.77
.393	.598	.330	.214	.258	— .154	— .034	.76
.033	.481	— .046	— .239	.083	.311	— .347	.52
.392	.572	— .008	— .186	— .227	.143	— .263	.65
.628	.130	— .235	— .134	.120	— .160	.041	.53
.652	.173	— .309	— .508	.201	— .241	.116	.92
.597	— .058	— .373	— .332	.404	.182	.135	.82
.619	.159	— .439	— .273	.143	.078	— .231	.76
5.92	4.11	2.16	1.60	1.17	0.74	0.98	16.68

by solving for the direction cosines of planes which contain or pass close to the most points, and therefore have the fewest high projections on the normals. We make an arbitrary choice among the many effective ways of selecting direction cosines to accomplish this end, but the transformation which we determine must be one which will achieve it.

In this study, the best-fitting system of coordinates was defined as

that which maximized for each column of the factorial matrix the function

$$w = \sum \frac{1}{x^2 + c},$$

where x represents the transformed loading in each variable in turn, summed over the column. This criterion gives greatest weight to those tests which fall almost on a plane, thus attracting the plane through these points and elevating the loadings of those tests which stand off from it, indicating clearly which tests are of significance in naming the factor. Other criteria would give solutions differing only in the clarity with which the patterns stand out. The constant c determines the relative weight given tests at varying distances from the plane. It was assigned the value of .1 for the initial attack upon each column, and planes III, IV, VI, and VII were stabilized with this criterion. Planes I, II, and V had to be determined with c equal to .01, a less coarse criterion giving greatest weight to the tests with very small loadings. Using the first trial value of c , it was impossible to stabilize them distinctively.

Solution for the parameters, the elements of the transformational matrix, cannot be made directly. An iterative method was used. The approximation was regarded as sufficiently close when no increase in the function was brought about by a set of corrections to the last trial parameters, no correction in the set exceeding .05. The planes are quite stable by the time such small corrections are being used, and any further changes would be minute in comparison with chance errors. A final set of corrections with maximum .03 was applied, but the values used as point of departure for this set were retained if there was no increase in w .

TABLE 2
MATRIX OF THE TRANSFORMATION

	I	II	III	IV	V	VI	VII
I	.352	.031	.245	.073	.269	— .046	.132
II	— .040	.676	— .323	.127	.020	.043	— .206
III	— .178	.462	.771	— .306	.164	.076	— .067
IV	.271	.061	— .460	— .604	— .005	.015	.315
V	— .509	.246	— .022	.253	— .915	— .095	.206
VI	— .297	.300	.138	— .476	— .203	.985	— .296
VII	.650	.417	— .104	.479	— .149	— .104	— .841

The transformation so determined is given in Table 2, and the new matrix of factor loadings in Table 3. These factors are not orthogonal; the rigid and distorting requirement of independence has been removed. Since no trait involves all seven factors, a simple structure is found to exist. This simple structure may not be unique, however, because of the high ratio of number of factors to number of variables. The primary axes were computed by solving for the lines of intersection of every group of six planes, leaving out one of the seven each time. It was not necessary to recompute coordinates in terms of the primary axes, as those are proportional in each column to the transformed loadings. It was observed that, while the factors are no longer independent, no two are identical; if we regard the correlation coefficients as cosines, the closest approach of the normals to any two planes is 55 degrees (IV and VI), and the primary axes of these two factors are still separated by 35 degrees.

Factor I has its highest loading in social interests, loadings over .20 in all other social items, in aesthetic ideals and beliefs, in political interests, theoretical beliefs, and religious interests, and a high negative loading in political people. Factor II has high loadings in all economic and political items, negative loadings in aesthetic items and theoretical beliefs; political ideals and economic interests are almost pure measures of this factor. Factor III has high loadings in all the theoretical items, and a significant positive loading in economic ideals and a negative one in social interests; theoretical ideals and preferences in people are almost pure measures of this factor. Number IV has high positive loadings in the religious scores, and a high negative loading in economic beliefs. The significant positive loadings in Factor V occur in theoretical interests and beliefs, economic ideals, aesthetic beliefs, social interests and ideals, and political beliefs; there is a negative loading in religious people. The significant loadings in Factor VI are in economic and political people and beliefs, with aesthetic beliefs and religious interests and ideals standing out on the other side. Factor VII has high loadings in aesthetic interests and people, probably significant negative loadings in social and aesthetic ideals.

The highest correlations among the factors are between IV and VI, IV and VII, VI and VII, VI and I, VII and I, and VII and II. No one of the first four primary axes is within 60 degrees of one of the other three.

TABLE 3
TRANSFORMED FACTOR LOADINGS

Variable (1)	Symbol (2)	Items* (3)
1. Theoretical interests	T in	(1 <i>b</i> , 2 <i>f</i> , 5 <i>a</i> , 7 <i>b</i> , 9 <i>d</i> , 16 <i>a</i>)
2. Theoretical ideals	T id	(4 <i>f</i> , 4 <i>i</i> , 8 <i>f</i> , 13 <i>e</i> , 13 <i>j</i> , 13 <i>k</i>)
3. Theoretical preferences in people	T p	(6 <i>i</i> , 6 <i>j</i> , 6 <i>o</i> , 6 <i>y</i> , 11 <i>e</i> , 14 <i>e</i>)
4. Theoretical beliefs	T b	(3 <i>e</i> , 10 <i>a</i> , 12 <i>d</i> , 15 <i>e</i> , 17 <i>e</i> , 18 <i>c</i>)
5. Economic interests	E in	(1 <i>e</i> , 2 <i>d</i> , 5 <i>c</i> , 7 <i>a</i> , 9 <i>c</i> , 16 <i>b</i>)
6. Economic ideals	E id	(4 <i>g</i> , 4 <i>j</i> , 8 <i>c</i> , 13 <i>a</i> , 13 <i>i</i> , 13 <i>m</i>)
7. Economic preferences in people	E p	(6 <i>a</i> , 6 <i>c</i> , 6 <i>g</i> , 6 <i>w</i> , 11 <i>a</i> , 14 <i>c</i>)
8. Economic beliefs	E b	(3 <i>c</i> , 10 <i>f</i> , 12 <i>e</i> , 15 <i>a</i> , 17 <i>c</i> , 18 <i>a</i>)
9. Aesthetic interests	A in	(1 <i>a</i> , 2 <i>c</i> , 5 <i>d</i> , 7 <i>c</i> , 9 <i>b</i> , 16 <i>c</i>)
10. Aesthetic ideals	A id	(4 <i>b</i> , 4 <i>e</i> , 8 <i>b</i> , 13 <i>d</i> , 13 <i>n</i> , 13 <i>r</i>)
11. Aesthetic preferences in people	A p	(6 <i>e</i> , 6 <i>k</i> , 6 <i>r</i> , 6 <i>u</i> , 11 <i>c</i> , 14 <i>b</i>)
12. Aesthetic beliefs	A b	(3 <i>d</i> , 10 <i>b</i> , 12 <i>b</i> , 15 <i>d</i> , 17 <i>a</i> , 18 <i>d</i>)
13. Social interests	S in	(1 <i>d</i> , 2 <i>b</i> , 5 <i>b</i> , 7 <i>e</i> , 9 <i>e</i> , 16 <i>e</i>)
14. Social ideals	S id	(4 <i>c</i> , 4 <i>l</i> , 8 <i>e</i> , 13 <i>h</i> , 13 <i>p</i> , 13 <i>q</i>)
15. Social preferences in people	S p	(6 <i>b</i> , 6 <i>g</i> , 6 <i>l</i> , 6 <i>x</i> , 11 <i>f</i> , 14 <i>f</i>)
16. Social beliefs	S b	(3 <i>a</i> , 10 <i>d</i> , 12 <i>f</i> , 15 <i>b</i> , 17 <i>b</i> , 18 <i>f</i>)
17. Political interests	P in	(1 <i>f</i> , 2 <i>e</i> , 5 <i>f</i> , 7 <i>d</i> , 9 <i>f</i> , 16 <i>d</i>)
18. Political ideals	P id	(4 <i>d</i> , 4 <i>k</i> , 8 <i>a</i> , 13 <i>b</i> , 13 <i>c</i> , 13 <i>f</i>)
19. Political preferences in people	P p	(6 <i>d</i> , 6 <i>f</i> , 6 <i>n</i> , 6 <i>t</i> , 11 <i>b</i> , 14 <i>d</i>)
20. Political beliefs	P b	(3 <i>b</i> , 10 <i>e</i> , 12 <i>c</i> , 15 <i>f</i> , 17 <i>d</i> , 18 <i>b</i>)
21. Religious interests	R in	(1 <i>c</i> , 2 <i>a</i> , 5 <i>e</i> , 7 <i>f</i> , 9 <i>a</i> , 16 <i>f</i>)
22. Religious ideals	R id	(4 <i>a</i> , 4 <i>h</i> , 8 <i>d</i> , 13 <i>g</i> , 13 <i>l</i> , 13 <i>o</i>)
23. Religious preferences in people	R p	(6 <i>h</i> , 6 <i>m</i> , 6 <i>p</i> , 6 <i>s</i> , 11 <i>d</i> , 14 <i>a</i>)
24. Religious beliefs	R b	(3 <i>f</i> , 10 <i>c</i> , 12 <i>a</i> , 15 <i>c</i> , 17 <i>f</i> , 18 <i>e</i>)

*Items are in test copy at end.

INTERPRETATION

Before venturing any interpretation of these results, it is well to make clear the relationship between this work and Spranger's types, and the bearing this work has on type psychology in general. Spranger believes that he is dealing with intuitively apprehended essences, and

TABLE 3 (*continued*)

I Social (4)	II Philistine (5)	III Theoretical (6)	IV Religious (7)	V Open-minded (8)	VI Practical (9)	VII Aesthetic (10)
.00	— .16	.77	— .05	.52	— .01	— .01
— .01	.03	.80	.15	.03	— .01	— .12
.01	— .01	.72	— .07	— .03	.02	.03
.27	— .26	.49	— .12	.47	— .05	.13
— .05	.59	— .07	.05	— .01	.02	— .06
.03	.48	.29	.10	.28	— .08	— .05
— .12	.34	— .02	— .02	.01	.23	.01
.00	.35	.03	— .47	.19	.42	.09
.01	— .59	— .06	— .11	.01	— .17	.64
.51	— .14	— .10	.08	— .01	.07	— .21
— .05	— .47	.09	— .17	— .14	.09	.45
.43	— .47	.04	.09	.24	— .20	.13
.60	.03	— .30	— .02	.44	— .10	— .02
.49	.05	.04	— .09	.39	.24	— .21
.29	— .01	.04	.03	— .11	— .01	.14
.41	— .03	.03	— .01	.17	.17	— .09
.32	.55	— .07	— .13	— .01	— .05	— .03
.00	.59	.04	.00	— .03	— .13	.10
— .43	.25	.00	— .07	— .07	.35	.05
— .03	.26	.04	— .03	.34	.19	.01
.24	— .01	— .04	.34	.05	— .22	.07
.19	— .01	.05	.69	— .02	— .32	— .08
.02	.00	.03	.43	— .32	.06	— .08
— .03	— .13	— .08	.25	— .01	.03	.19

specifically denies the relevancy of any empirical test of his types. This analysis has been performed not on these entities directly, but upon material selected to conform as well as possible to descriptions of them. The conclusions are not directed at the types as intuitive reals, with which the writer is not concerned. They do have a direct bearing, however, on the utility of this type classification for what most American investigators would regard as scientific psychology.

If empirical studies differ in results from a *a priori* analysis, the American psychologist is likely to regard the results founded upon observation as a better basis for future investigation than the results obtained by intuition; if the two analyses are in agreement, he will tend to regard the conclusions which were arrived at by rational methods as hypotheses, now partially verified.

The factors found by this analysis are constellations, multi-dimensional patterns occurring in the material investigated for the population studied. Since there is no reason to believe either that such patterns would differ greatly for different populations or that the group used is markedly atypical in valuational attitudes, we are justified in drawing conclusions generalized with respect to population until evidence to the contrary is presented. The material was investigated, then, with an eye to determining the natural groupings of the items, which were regarded as falling into 24 rather specific categories. This is, in effect, an attempt to find generalized attitudes empirically. It differs from the approach used by Cantril (2) in that it does not assume beforehand what the attitudes will be, using the rational basis as indicating merely a likely field for discovery of such general values; it differs from the approach of Whisler (16) in that this preliminary narrowing of the field is performed.

The interpretation offered should be considered in the light of these relationships to other attacks upon the same problem.

The first four factors are, in the writer's opinion, the ones which should be taken as representing the second approximation to a stable system of categories for the classifying of personality. They cover the whole range of Spranger's six types, three of which turn out to be difficult to distinguish empirically. Factor I is clearly *social* and altruistic, a factor having to do with the valuing of human relations as such, and corresponding rather closely to the factor "interest in people" which Thurstone (12) found in his analysis of Strong's Vocational Interest Schedule. The second is complex, involving items supposed to correspond to Spranger's economic and political types, and inversely to the aesthetic type; one might call this pattern the *Philistine* type, aggressive, go-getting, utilitarian, anti-cultural. Factor III is plainly *theoretical*, corresponding to Thurstone's (12) "interest in science" and Whisler's (16) "criticalness and interest in the truth." Number IV is the *religious* type, probably more closely connected with doctrine and practice than the vague mystical

unity with the cosmos that Spranger envisaged. All investigators using the Allport-Vernon blank have found a close relationship to exist between the political and economic scores, and an inverse one between these and aesthetic items; there is nothing particularly surprising in the conclusion that high scores on both political and economic items are due to high scores in a single factor, or even that high aesthetic scores indicate primarily low loadings in this factor, but the basic identity was not brought out by simple correlational analysis without the multiple factor techniques.

Factors V, VI, and VII are minor temperamental and attitude factors influencing the pattern in a way cutting more or less across the basic type classes. That they are of lesser importance is shown by the fact that they contribute less to the total variance and that they show close relationships to some of the other factors. Number V is something that enters positively into some theoretical and social scores and negatively into some religious scores; we might call it *open-mindedness*. This may be related to the radicalism-conservatism or church-antichurch factor found by Mrs. Thurstone, as reported by Thurstone (14), and studied by Carlson (4). Number VI is something that enters positively into some economic, political, and social scores and negatively into some aesthetic scores and some religious scores; we might call it *practicality*. Factor VII is another sort of *aesthetic* factor, which is not related in any way to political and economic scores and is somehow anti-idealistic, even if the ideals be aesthetic ones. Its heavy loadings are in aesthetic interests and preferences in people; a sort of spectatorial aestheticism is suggested. Probably this factor reflects the social pressure exerted on most of the subjects to do at least lip-service to culture; it is a superficially aesthetic component, as is shown by the negative loading in aesthetic ideals. Factor VI to a large extent is probably also an expression of social pressure. These three are the important factors which were not controlled in setting up the material. If we accept only the first four factors as pertinent, the communalities are all around .60. Probably it will be impossible to purify our type tests of these secondary factors; it may not be desirable to do so.

The next problem, one not attempted in this study, is to set up self-consistent measures of the four basic types, involving as little else as possible. Economic interests and political ideals offer material ready to hand for Philistinism, and theoretical interests and

preferences in people for theoreticalness; the other material used was not so clean-cut, and perhaps varieties not used in this study will prove more satisfactory.

SUMMARY AND CONCLUSIONS

In an attempt to determine stable categories for the classification of personality with regard to value-types, a test-blank was written with 144 items classed according to Spranger's system and was administered to 203 freshmen and sophomores at the University of Chicago. It was scored in such a way as to yield four measures corresponding to each of Spranger's six types for each subject. Tetrachoric correlations were obtained, and a factor analysis was performed by Thurstone's centroid method. The orthogonal factorial matrix was subjected to a transformation maximizing the number of small entries, thus forming a matrix of oblique coordinates in which seven patterns stand out very clearly.

The four basic clusters of items, or four basic attitudes, were found to be: I—the *social* type, which values especially human relations; II—the *Philistine* type, which emphasizes utility and power at the expense of beauty and harmony; III—the *theoretical* type, which stresses truth and the cognitive values; and IV—the *religious* type, which emphasizes the spiritual side of life. Three less important factors influencing the scores to a marked extent were found. These are: V—*open-mindedness*; VI—*practicality*; VII—an *aesthetic* attitude, but of a superficial and onlooking rather than participating sort.

It is believed by the writer that a more plausible and self-consistent system of personality classification can be founded on the four types derived by factor analysis than on the six types which Spranger developed by intuitive analysis of experience.

TABLE 4
ABBREVIATIONS USED IN KEYING TEST ITEMS

Types	Classes
T.....theoretical	in.....interests
E.....economic	id.....ideals
A.....aesthetic	p.....preferences in people
S.....social	b.....beliefs
P.....political	
R.....religious	

THE TEST ITEMS AND THE KEY*

	Key
1. Granting that you had the necessary ability and training, indicate how much you would like to teach each of these subjects:	in
a. Modern Poetry	A
b. Algebra	T
c. Comparative Religions	R
d. Labor Relations	S
e. Advertising	E
f. Recent Political Theory	P
2. In a magazine such as <i>Time</i> , to what extent would you be interested in the sections headed as follows:	in
a. Religion	R
b. People	S
c. Art	A
d. Business and finance	E
e. National Affairs	P
f. Science	T
3. To what extent does each of the following possible ends of scientific research appeal to you as an important object:	b
a. Increase sum total of human happiness	S
b. Increase power of civilized nations	P
c. Increase wealth	E
d. Make the world more beautiful	A
e. Discover pure truth	T
f. Pave the way for a more spiritual attitude toward life	R
4. Granting ability and opportunity, to what extent do these careers attract you, assuming that any can satisfy your material need:	id
a. Missionary	R
b. Musician	A
c. Clinic Assistant	S
d. Congressman	P
e. Portrait painter	A
f. Astronomer	T
g. Efficiency Expert	E
h. Minister	R
i. Mathematician	T
j. Civil Engineer	E
k. Diplomat	P
l. Relief Worker	S
5. How does each of these magazines appeal to you, because of its contents and policies:	in
a. Scientific American	T
b. Social Forces	S

*The format of this Journal prohibits the facsimile reproduction of the seven columns which are arranged vertically to the right of the test items and in which the check marks are made by the subjects.

c. Nation's Business	Key
d. Saturday Review of Literature	E
e. Christian Century	A
f. Current History	R
6. To what extent do these famous personages appeal to you, because of what they seem to embody in their lives and work:	P
a. Croesus	E
b. Socrates	S
c. Robert Fulton	E
d. Mussolini	P
e. Michelangelo	A
f. Alexander	P
g. Gandhi	S
h. Martin Luther	R
i. Galileo	T
j. Aristotle	T
k. Beethoven	A
l. St. Francis of Assisi	S
m. St. Augustine	R
n. Napoleon	P
o. Einstein	T
p. Buddha	R
q. Henry Ford	E
r. Homer	A
s. Mary Baker Eddy	R
t. Julius Caesar	P
u. Edna St. Vincent Millay	A
v. Newton	T
w. Columbus	E
x. Florence Nightingale	S
7. If your son (or daughter) in college used his (her) spare time in one of the following ways, how greatly pleased would you be:	in
a. Took part-time job (unneeded)	E
b. Debated	T
c. Joined poetry society and wrote	A
d. Ran for campus offices	P
e. Engaged in fraternal and social activities	S
f. Was active in YMCA (YWCA), etc.	R
8. All material considerations aside, and assuming interest, to what extent would you encourage your children to seek careers in:	id
a. Politics	P
b. Literature	A
c. Business	E
d. Theology	R
e. Social service	S
f. Philosophy	T
9. If you had a considerable sum of money at your disposal, how probable does it seem to you that you would:	in

		Key
a. Donate it to church work		R
b. Endow a symphony orchestra		A
c. Invest it in industry		E
d. Endow a biological laboratory		T
e. Spend it in anonymous charitable gifts		S
f. Use it in a campaign as a candidate for state office		P
10. To what extent should the purpose of education be to teach people to:		b
a. Think clearly		T
b. Be alive to beauty		A
c. Understand the meaning of life		R
d. Be amiable and sympathetic		S
e. Be ambitious and striving		P
f. Be busy and productive		E
11. Do you like to associate with people who are:		p
a. Able to help you along		E
b. Successful and eminent		P
c. Interested in beautiful things		A
d. Spiritual and reverent		R
e. Intellectual and stimulating		T
f. Sociable and friendly		S
12. To what extent should governments exist for the purpose of:		b
a. Uniting the people in a high moral attitude		R
b. Fostering the arts		A
c. Offering opportunity to ambitious citizens		P
d. Providing educational facilities and fostering research		T
e. Fostering industrial production		E
f. Taking responsibility for the well-being of the governed		S
13. To what extent would you relish being considered:		id
a. Efficient		E
b. Ambitious		P
c. A leader		P
d. A connoisseur		A
e. Intelligent		T
f. Aggressive		P
g. Reverent		R
h. An altruist		S
i. Practical		E
j. Intellectual		T
k. A thinker		T
l. An idealist		R
m. A producer		E
n. Talented		A
o. High-minded		R
p. Loyal		S

	q. Likeable	Key S
	r. Artistic	A
14.	In choosing a mate, would you prefer	
a	a person who is:	p
a.	Spiritual	R
b.	Sensitive and talented	A
c.	Industrious and thrifty	E
d.	Able to command the admiration of others	P
e.	Able to offer intellectual companion-ship	T
f.	Unselfish and companionable	S
15.	Do you believe that a good argument against war is that:	b
a.	It destroys property and piles up debts	E
b.	It is cruel and causes suffering	S
c.	It does violence to Man's highest ideals	R
d.	It is dirty and hideous	A
e.	It is irrational and senseless	T
f.	It is ineffective as an instrument of national policy	P
16.	In what measure would lectures announced under these titles appeal to you:	in
a.	Postulates of Scientific Method	T
b.	Budgeting a Reduced Income	E
c.	Architecture in Relation to the Other Arts	A
d.	Dictators and Their Exercise of Power	P
e.	A Life of Service	S
f.	The New Paganism	R
17.	A white-collar worker such as a bookkeeper can best spend his one day of leisure, Sunday, by:	b
a.	Attending museum exhibits, concerts, etc.	A
b.	Staying with his family and friends	S
c.	Attempting to earn extra money	E
d.	Making contacts to advance his social position	P
e.	Seeking knowledge	T
f.	Examining his conduct of life, in church	R
18.	Would you say that what the world needs is:	b
a.	More efficient distribution of goods	E
b.	Leaders who can impose order	P
c.	Insight into the causes of present world maladjustments	T
d.	The replacement of the ugliness of modern life by new beauty	A
e.	A rekindling of true religious thought and action	R
f.	More stress upon wholesome human relationships	S

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